I. SUMMARY OF THE JULY 31ST, 2002 OFFICE ACTION

Section 103 Rejections

In the Final Rejection, claims 1-23 were rejected (for the first time) under 35 U.S.C. § 103(a) as being unpatentable solely over Puntambekar et al. U.S. Patent 5,714,037. This first time rejection of all of the claims on a new grounds of rejection, i.e., solely on the Puntambekar et al. U.S. Patent 5,714,037, in a Final Rejection without any previous amendment of independent claims 11 and 19 (or any of the 11 dependent claims which depend from either of these independent claims) is not proper and must be protested.

The 7/31/2002 Office Action (in paragraph 1 on page 2) appears to be also rejecting some or all of Applicants' claims in a rejection which involves the Puchner et al. patent (as will be discussed in more detail below.), but does not identify the portion of 35 U.S.C. 102 being relied on as the grounds of rejection.

II. THE REFERENCES

A. The Puntambekar et al. Reference

Puntambekar et al. U.S. Patent 5,714,037 teaches the roughening of a silicon oxide surface of a silicon oxide film in a nitrogen plasma in an RIE plasma etcher operating at a high DC bias of 600 volts DC or higher.

B. The Puchner et al. Reference

Puchner et al. U.S. Patent 6,156,620 describes an isolation trench in a silicon semiconductor which is provided with a barrier region containing nitrogen atoms formed in the

trench, contiguous with the silicon semiconductor substrate surfaces of the trench. The isolation trench structure is formed by etching an isolation trench in a silicon semiconductor substrate; forming in the isolation trench a barrier region by bombarding the trench structure with nitrogen atoms from a nitrogen plasma; and then forming a silicon oxide layer over the barrier region in the trench to confine the nitrogen atoms in the barrier region. In a preferred embodiment, a silicon oxide liner is first formed over the silicon semiconductor substrate surfaces of the trench, and then the trench structure is treated with nitrogen atoms from a nitrogen plasma to form, on the silicon semiconductor substrate surfaces of the trench, a barrier layer which contains silicon atoms, oxygen atoms, and nitrogen atoms.

III. THE INVENTION

The invention comprises a process for etching oxide wherein a reproducibly accurate and uniform amount of silicon oxide can be removed from a surface of an oxide previously formed over a semiconductor substrate by exposing the oxide to a nitrogen plasma in an etch chamber while applying an rf bias to a substrate support on which the substrate rests in the etch chamber. The thickness of the oxide removed in a given period of time may be changed by changing the amount of rf bias power applied to the substrate through the substrate support.

IV. DISCUSSION

A. The Rejection of Claims 1-23 Solely on the Puntambekar et al. Reference

Claims 1-23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Puntambekar et al. U.S. Patent 5,714,037. As stated above, this rejection, while appearing in

a Final Rejection, is a first time rejection of all of the claims on a new grounds of rejection, namely a rejection of ***all of the claims*** which relies solely on the Puntambekar et al. U.S. Patent 5,714,037. It should be noted here that this new grounds of rejection in the Final Rejection is asserted against ***all of the claims*** despite the absence of any previous amendment of independent claims 11 and 19 (or any of the 11 dependent claims which depend from either of these independent claims).

This introduction, in a Final Rejection, of a new grounds of rejection of claims not necessitated by Applicants' amendment of such claims, is not proper and must be protested. If assertion of such a rejection based solely on the Puntambekar et al. patent is to be maintained, then the Finality of the Rejection should be withdrawn.

In further regard to the unseasonablness of the Final Rejection, and with respect to the disqualification of the Puchner et al. reference, Applicants must call attention to MPEP 706.02(l)(3), in part (D) under the subheading "Examination of Applications of Different Inventive Entities Where Common Ownership Has Not Been Established", which reads:

> "When applying any 35 U.S.C. 102(3)/103 references against the claims in applications filed on or after November 29, 1999, the examiner should anticipate that a statement of common ownership may disqualify any patent or application applied in a rejection under 35 U.S.C. 103 based on 35 U.S.C. 102(e). See MPEP § 706.02(1)(1). If such a statement is filed in reply to the 35 U.S.C. 102(e)/103 rejection and the claims are not amended, ***the examiner may not make the next Office Action final if a new rejection is made.***"(emphasis added)

With respect to the merits of the rejection of Applicants' claims over Puntambekar et al., Applicants' invention comprises the removal of precise thicknesses of silicon oxide using a nitrogen plasma and ***an rf power bias*** applied to the substrate support on which the rests the substrate having the silicon oxide surface thereon. In contrast, Puntambekar et al. uses an RIE

etcher with a ***high DC voltage bias*** in combination with a nitrogen plasma to achieve their desired roughening of the surface of their substrate to facilitate adhesion of their roughened surface to other materials.

With the cancellation of claims 1-3, all of Applicants' claims now recite the use of ***an rf power bias applied to the substrate support*** on which the substrate lies during their treatment to precisely remove a given thickness of silicon oxide by their process. Applicants have failed to note any mention by Puntambekar et al. of the use of an rf power ***bias applied to their substrate support.*** No teachings or suggestions have been found in the Puntambekar et al. reference which would suggest Applicants' process for removing precise thicknesses of silicon oxide using an rf power bias applied to the substrate support.

B. **The Possible Rejection of Some or All of the Claims over the Puchner et al. and Puntambekar et al. References**

The 7/31/2002 Final Rejection (in paragraph 1 on page 2) appears to be also rejecting some or all of Applicants' claims in a rejection which involves the Puchner et al. patent. The Puchner et al. patent, in combination with the Puntambekar et al. patent, formed the basis for the previous rejection of all of the original claims in the earlier Office Action. Paragraph 1, on page 2 of the Final Rejection, (which apparently is in response to Applicants' earlier submittal of an affidavit to overcome a 35 U.S.C. 103(a) reference based on 35 U.S.C. 102 (e, f, or g)], indicates that the Puchner et al. reference is not disqualified as a reference by that affidavit because "...this applied art additionally qualifies as prior art under another subsection of 35 U.S.C. 102 , and accordingly is not disqualified as prior art under 35 U.S.C. 103."

However, this rejection (if that is what it is) does not: (A) refer to any particular claims,

as rejected over the Puchner et al. reference, does not (B) refer to any reference with which the Puchner et al. reference is to be combined, and does not (C) refer to any particular subsection of 35 U.S.C. 102 to be combined with 35 U.S.C. 103 (c) to form the legal basis under which the Puchner et al. reference is not disqualified.

Applicants must protest these informalities and request that the grounds of rejection be clearly recited. I.e., if the previous grounds of rejection on the combination of Puchner et al. and Puntambekar et al. is being reasserted, the Final Rejection should clearly say so, and should state which section of 35 U.S.C. 102 is being combined with 35 U.S.C. 103 (c). It should be noted, in this regard, that if this case proceeds to appeal, the Board of Appeals may not look kindly on such vagueness and might well send the case back to the USPTO group for further clarification and development of the issues.

C. **The Provisional Rejection of a Claim (Obviousness) Under 35 U.C.S. 102(e)/103 and Subsequent Disqualification of a Reference**

MPEP 706.02 (k) provides that when two applications of different inventive entities, are filed after November 29, 1999, a provisional rejection under 35 U.S.C. 102(e)/103 should be made in the later filed case if the applications have a common assignee or a common inventor

This section of MPEP goes on to state that provisional rejections can be overcome by:

(A) Arguing patentability over the earlier filed application;

(B) Combining the subject matter of the copending applications into a single application claiming benefit under 35 U.S.C. 120 of the prior applications and abandoning the copending applications.

(C) Filing an affidavit or declaration under 37 CFR 1.132 showing that any unclaimed invention disclosed in the copending application was derived from the inventor of the other application and is thus not invention "by another".

(D) Filing an affidavit or declaration under 37 CFR 1.131 showing a date of invention prior to the effective U.S. filing date of the copending application. or

(E) Filing a continuation application on or after November 29, 1999, and showing that the prior art and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

In Applicants' instant case, they have a filing date on or after November 29, 1999, and they have already made a showing that the prior art (Puchner et al.) and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person. Therefore, it appears that paragraph (E) above is dispositive regarding the disqualification of the Puchner et al. reference, and Applicants previously filed affidavit should meet the requirements of this section of the MPEP.

Finally, attention is drawn to MPEP sample rejection paragraph 7.21.02 entitled "Common Assignee or at Least One Common Inventor" which is used to reject the invention under 35 U.S.C. 102(e)/103. The given remedies for overcoming this grounds of rejection read very similarly to the words in the Final Rejection. However, the instant rejection fails to heed the "Examiner's Note" just below the sample wording. This note states:

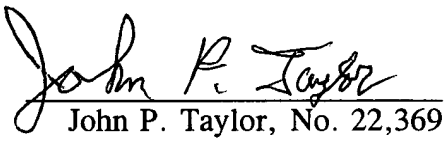
> "This paragraph is used to reject over a patent with an earlier filing date that discloses the claimed invention. The patent must have either a common assignee or at least one common inventor. This form paragraph should **not** be used in applications filed on or after November 29, 1999, when the application being examined establishes that it and any reference patent or application were owned by, or subject to an obligation or assignment to, the same person, at the time the invention was made." (Emphasis in MPEP)

V. SUMMARY

Puntambekar et al. do not teach or suggest Applicants' claimed invention. The use of an rf bias is neither taught nor suggested by Puntambekar et al., who use a high voltage DC bias (~500 volts DC). Entering a Final Rejection at this point in the prosecution is unseasonable and not justified by amendments to the claims (or, more accurately, the absence of same in claims 11-23), by Applicants. The Puchner et al. patent has been disqualified under Sections 102(e)/103(a), 102(f)/103(a), and 102(g)/103(a), by the affidavit of common ownership previously submitted to the USPTO; and no other specific grounds under Section 102/103(a) have been offered have been offered by the USPTO in replacement.

If the Examiner in charge of this case feels that there are any remaining unresolved issues in this case, the Examiner is urged to call the undersigned attorney at the below listed telephone number which is in the Pacific Coast Time Zone.

Respectfully Submitted,



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